

What is claimed is:

1. A process for preparing optically active hydroxy-, alkoxy-, amino-, alkyl-, aryl- or chlorine-substituted alcohols or hydroxy carboxylic acids having from 3 to 25 carbon atoms or their acid derivatives or cyclization products by hydrogenating the correspondingly substituted optically active mono- or dicarboxylic acids or their acid derivatives in the presence of a catalyst whose active component comprises a noble metal selected from the group of the metals Pt, Pd, Rh, Ir, Ag, Au and at least one further element selected from the group of the elements: Sn, Ge, Mo, W, Ti, Zr, V, Mn, Fe, Co, Ni, Cu, Zn, Ga, In, Pb, Bi, Cr, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu.
2. The process according to claim 1, wherein the noble metal is selected from the group of the metals Pt, Pd, Rh and Ir.
- 15 3. The process according to claim 1 to 2, wherein the at least one further element is selected from the group of the elements: Sn, Ge, Cr, Mo and W.
4. The process according to claim 1 to 3, wherein the at least one further element is Sn.
- 20 5. The process according to claim 1 to 4, wherein the active component of the catalyst comprises Pt and Sn.
- 25 6. The process according to claim 1 to 5, wherein optically active mono- or dicarboxylic acids or their acid derivatives are used which are at least one stereocenter in the  $\alpha$ - or  $\beta$ -position to at least one carboxylic acid function or acid derivative function derived therefrom to be hydrogenated.
- 30 7. The process according to claim 1 to 6 for preparing 1,2-propanediol, 1,2-butanediol, 1,2-pentanediol, 1,3-pentanediol, leucinol, isoserinol, valinol, isoleucinol, serinol, threoninol, lysinol, phenylalaninol, tyrosinol, prolinol, 2-chloropropanol, 2-methyl-1-butanol, 2,3-dimethylbutane-1,4-diol, 2-methylbutane-1,4-diol, 1,2,4-butanetriol, 1,2,5-pantanetriol, 1,2,6-hexanetriol, 35 2-hydroxy- $\gamma$ -butyrolactone, 3-hydroxy- $\gamma$ -butyrolactone, 2-chloro- $\gamma$ -butyrolactone, 3-chloro- $\gamma$ -butyrolactone, 2-amino- $\gamma$ -butyrolactone, 3-amino- $\gamma$ -butyrolactone, 2-methyl- $\gamma$ -butyrolactone, 3-methyl- $\gamma$ -butyrolactone, 3-hydroxy- $\delta$ -valerolactone, 4-hydroxy- $\delta$ -valerolactone, 2-hydroxytetrahydrofuran, 2-methyltetrahydrofuran, 2-aminotetrahydrofuran or 3,4-dihydroxybutyric acid.
- 40 8. The process according to claims 1 to 7, wherein the catalysts are used in supported form.

9. The process according to claim 8, wherein catalysts are used which, based in each case on the total weight of the finished catalyst and calculated as the metal, uses from 0.01 to 30% by weight of the noble metal and from 0.01 to 50% by weight of the at least one further element.
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10. The process according to claim 8 and 9, wherein the support material used is ZrO<sub>2</sub>, TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, activated carbon, carbon blacks, graphites or high-surface area graphites.
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11. The process according to claim 8 to 10, wherein the noble metal and the at least one further elements are applied to the support in the presence of a reducing agent.
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12. The process according to claim 1 to 11, wherein the hydrogenation is carried out at a pressure of from 100 to 300 bar.
13. The process according to claim 1 to 12, wherein the hydrogenation is carried out at a temperature of from 30 to 180°C.
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14. The process according to claim 1 to 13, wherein the hydrogenation is carried out in the presence of an acid.